X is selected from the group consisting of iodide, bromide, chloride, azide, tosylate, mesylate, nosylate, triflate, unsubstituted maleimide, maleimide substituted with one or two alkyl groups, and 3-sulfo-maleimide; and

R_1 and R_2 are the same or different and are selected from the group consisting of iodide, bromide, chloride, azide, tosylate, mesylate, nosylate, triflate, hydrogen, $-CONH_2$, carboxyl, hydroxyl, sulfonic acid, tertiary amine, quaternary ammoniumun, unsubstituted alkyl, substituted alkyl, -COOR', $-CONR'_2$, or COR', wherein the substituents of the substituted alkyl groups are selected from the group consisting of $-CONH_2$, carboxyl, hydroxyl, sulfonic acid, tertiary amine and quaternary ammonium and wherein R' is a C_1-C_6 alkyl or phenyl.

12. (Amended) The method according to claim 10, wherein the F-18-labeled peptide is labeled by a method comprising reacting a peptide comprising a free thiol group with a F-18 fluorinated alkene, wherein at least one of the two double-bonded carbon atoms bears at least one leaving group selected from the group consisting of iodide, bromide, chloride, azide, tosylate, mesylate, nosylate and triflate.